

Thames Water Utilities Ltd
Developer Services
Asset Development

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Potable Water
Flow & Pressure Feasibility Investigation

**Location: Bicester Eco Town, Banbury Road,
Bicester, Oxfordshire.**

DATE	ISSUE	AUTHOR	APPROVED
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Prepared by Thames Water Utilities Ltd

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1. INTRODUCTION

As per your request, dated 13 May 2011, this report is to evaluate the results of the flow and pressure test and to ascertain the availability of capacity within the existing local mains network and its ability to supply the proposed new domestic peak demand profile for North West Bicester Eco-Town, Oxfordshire.

The investigation will also determine whether or not any enhancement to the existing network is necessary to supply your requirement, while maintaining existing flows and pressures to our present customers.

2. EXISTING NETWORK

The local mains network is hydraulically dominated by the Ardley Reservoir., which is located to the west of Bicester. Source water is abstracted at Farmoor, treated and then pumped to Ardley Reservoir via a 24" and 900mm diameter trunk mains. At Woodstock this is then boosted to Ardley Reservoir via a 14" diameter trunk main. From Ardley Reservoir water then gravitates into the distribution network via a 18" diameter main. It is from this system that a supply to serve your proposed development will be taken.

3. EXISTING DEMAND TYPE

The local demand type is predominately residential and residential amenities, which have an overall peak morning water demand profile from the distribution mains network.

4. DOMESTIC DEMAND

The redevelopment of the site consists of 400 domestic dwellings.

Based on empirical and historical data for this type of use, maximum daily consumption will be 180,000 litres. By applying diversity factors, this equates to a morning peak demand profile of 8.5 l/s. However as this proposed development is to be an ecologically sustained development a flow rate of 4.03lts/sec has also been simulated as supplied from Hyder Consulting.

5. TEST LOCATION

It was essential to select a suitable washout to induce your flow requirements on our existing network. The following three criteria have determined the location of this washout:

- a) must be located on the main proposed to supply your domestic demand;
- b) must be closest to the point of entry of your connection; and
- c) located in such a manner that when the calibrated flow gauge is operated to induce the required flow rates, the discharged water will not cause flooding of existing properties.

The washout selected was on the 100mm diameter main in Banbury Road. Please refer to appendix for plan of the test location.

6. PRESSURE LOGGER LOCATIONS

Pressure Logger locations have been selected to comprehensively monitor the impact of the morning domestic peak demand profile on the existing mains network. Please refer to appendix for pressure logger location plans.

- Logger location 1 on the 250mm diameter main in Howles Road
- Logger location 2 on the 90mm diameter main in Gentian Close
- Logger location 3 on the 100mm diameter main in Oak Close
- Logger location 4 on the 100mm diameter main in Old School Close

7. INDUCED FLOWS

For the domestic demand, flow rates of 8.5 l/s, and 4.5 l/s were induced for 3 minute periods.

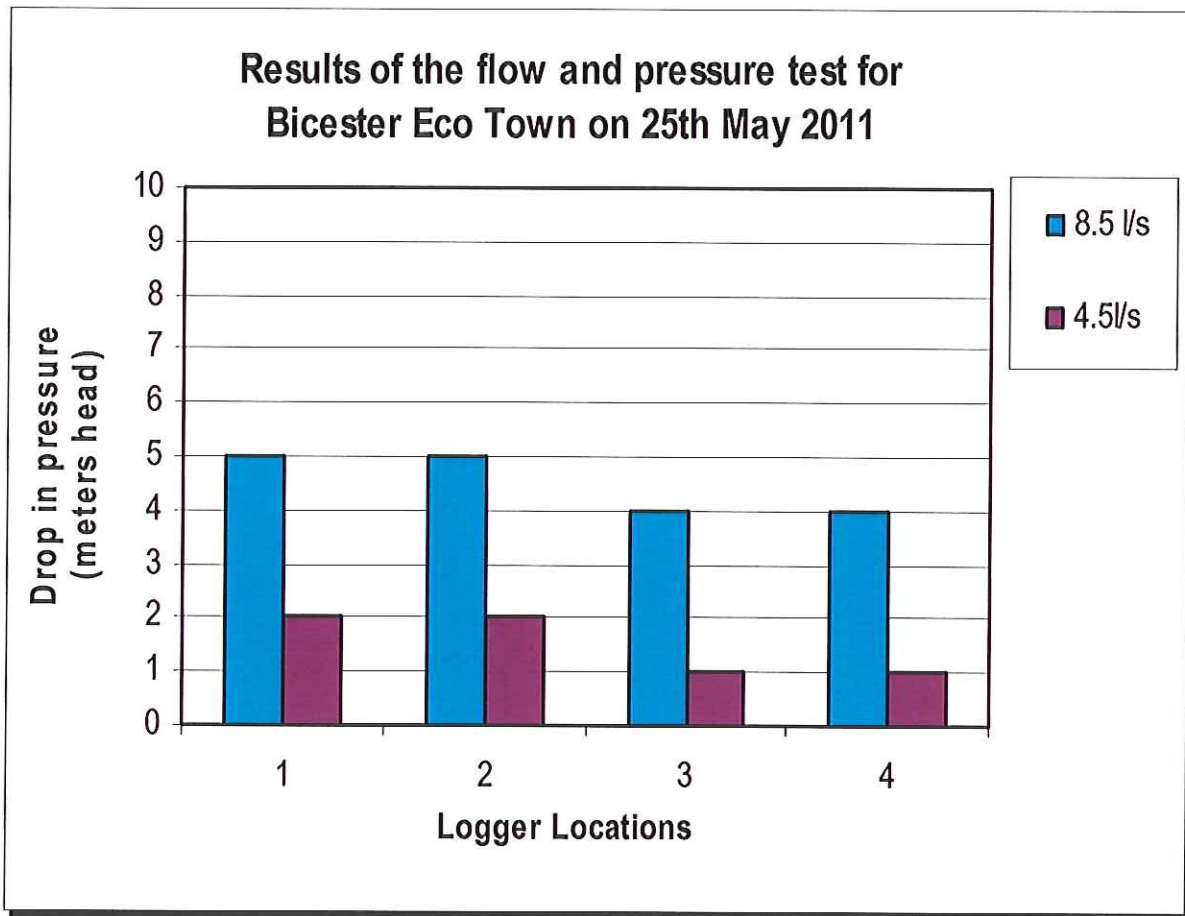
The flow rate was induced during the weekday peak morning demand period, Monday to Friday 07:00 - 08:30 inclusive. The pressure loggers monitoring the investigation will show a significant drop in pressure, if the network has insufficient spare capacity to supply the new peak demand.

8. INVESTIGATION RESULTS

The investigation was undertaken on 25th May 2011. All four pressure loggers provided the field data for the duration of the investigation. The drops in pressure recorded during the test are represented in the table and graph below.

Drop in pressure in metres head

Flow Rate	8.5 l/s	4.5l/s
Logger 1	5.0	2.0
Logger 2	5.0	2.0
Logger 3	4.0	1.0
Logger 4	4.0	1.0



These are within acceptable levels and show that the mains network is capable of supplying your proposed development of upto 400 dwellings and no major offsite mains reinforcement is required at present. If however should your proposal change this report will become invalid and a further test would be required.

The result of the seven day pressure logger showed the minimum pressure available at the site was 22.50 meters head, (2.2 Bar). This occurs between 7:30-8:30am. It is expected that on completion and occupation of the redevelopment, there would be a further reduction in pressure of approximately 2 meters head as shown in the flow test.

Please note that irrespective of the pressure which currently exists within the local mains network, Thames Water's minimum level of service is 10 metres head of pressure at the boundary stop valve.

See Appendix for the results graph of the 7 day pressure logger.

9. CONCLUSION

The result of the investigation has established the following: The network has sufficient spare capacity in the trunk main within Howels Road, however the distribution main within the Banbury Road will require upsizing to a minimum diameter of 150mm. This diameter will serve the 400 dwellings, any further development will require this main to be upsized at a later date. A full hydraulic Analysis will be required for the proposed development of up to 5,000 dwellings to fully understand the impact on the resources/trunk mains/reservoir's/pumping installations/distribution network/ environmental impact and the additional costs associated.

10. BUDGET COSTS FOR REINFORCEMENT

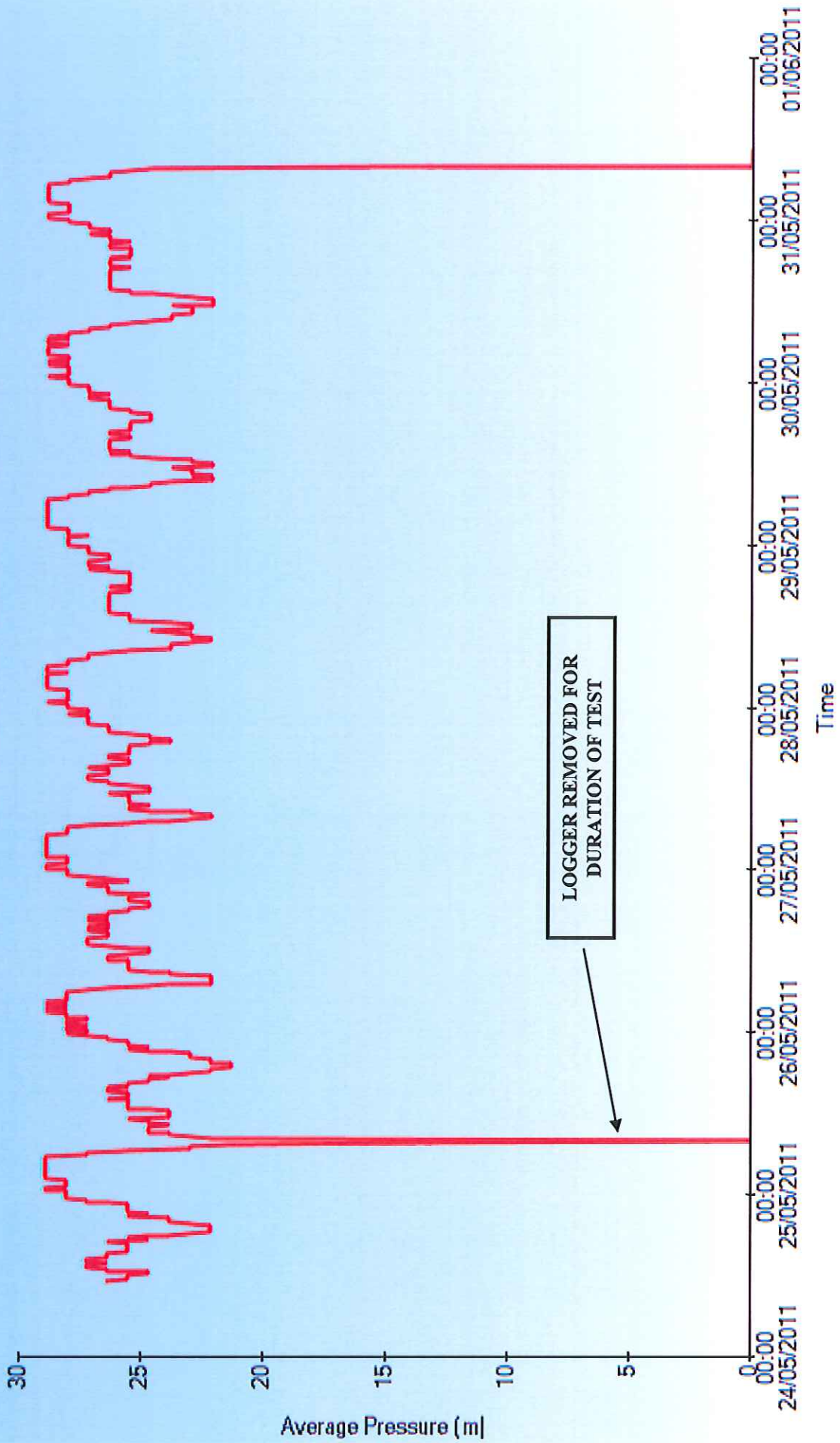
Please allow £250.00 per linear metre for 150mm diameter main.

APPENDIX

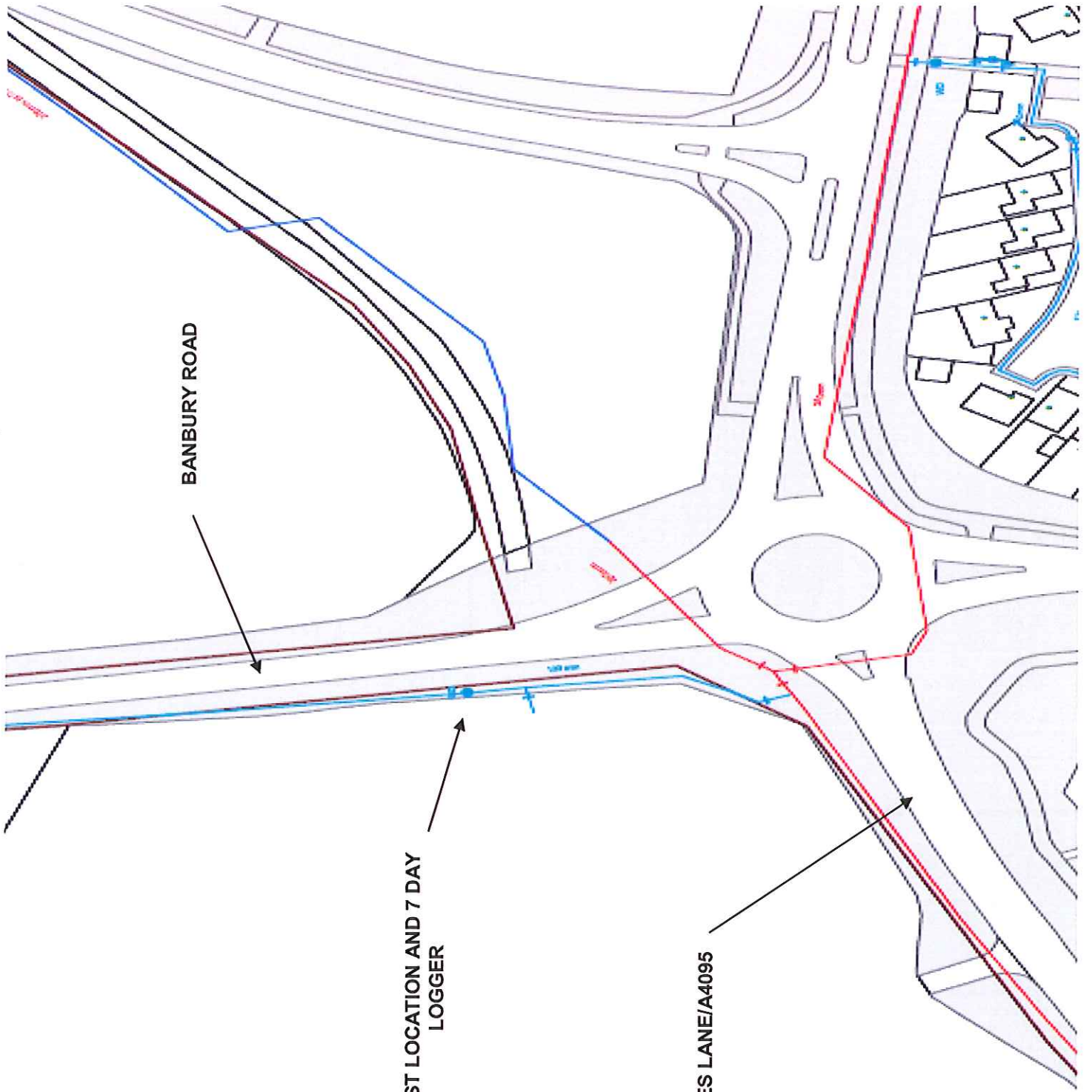
MAXIMUM PRESSURE 28.96 MTS

MINIMUM PRESSURE 22.50MTS

7 DAY LOG BICESTER ECO TOWN



PLEASE NOTE THAMES WATER'S MINIMUM LEVEL OF SERVICE IS 10 METRES HEAD AT THE PROPEERTY BOUNDARY VALVE



BANBURY ROAD

TEST LOCATION AND 7 DAY
LOGGER

HOWES LANE/A4095



GERMANDER WAY

HOWES LANE

LOGGER 1

180mm

360mm

250mm

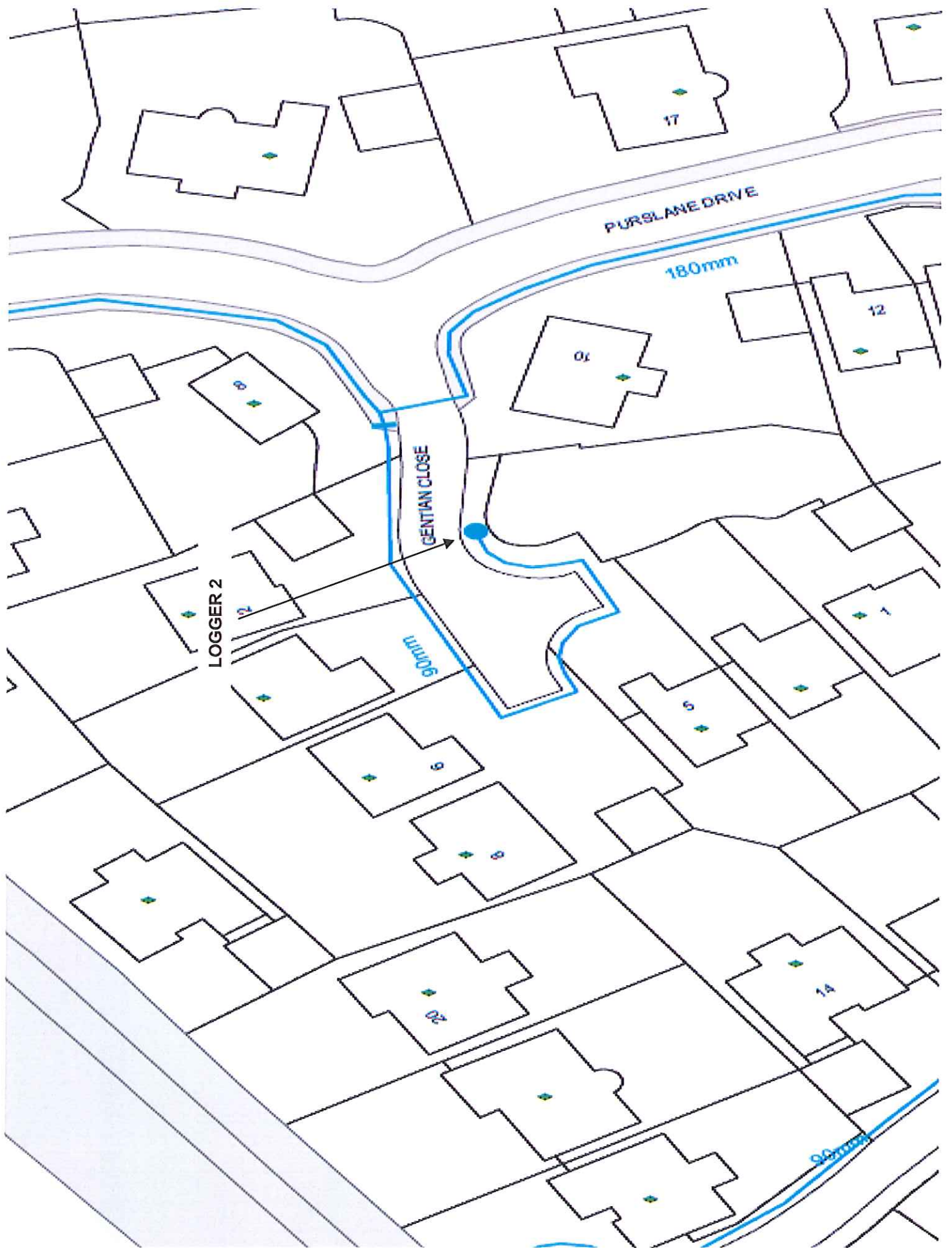
67

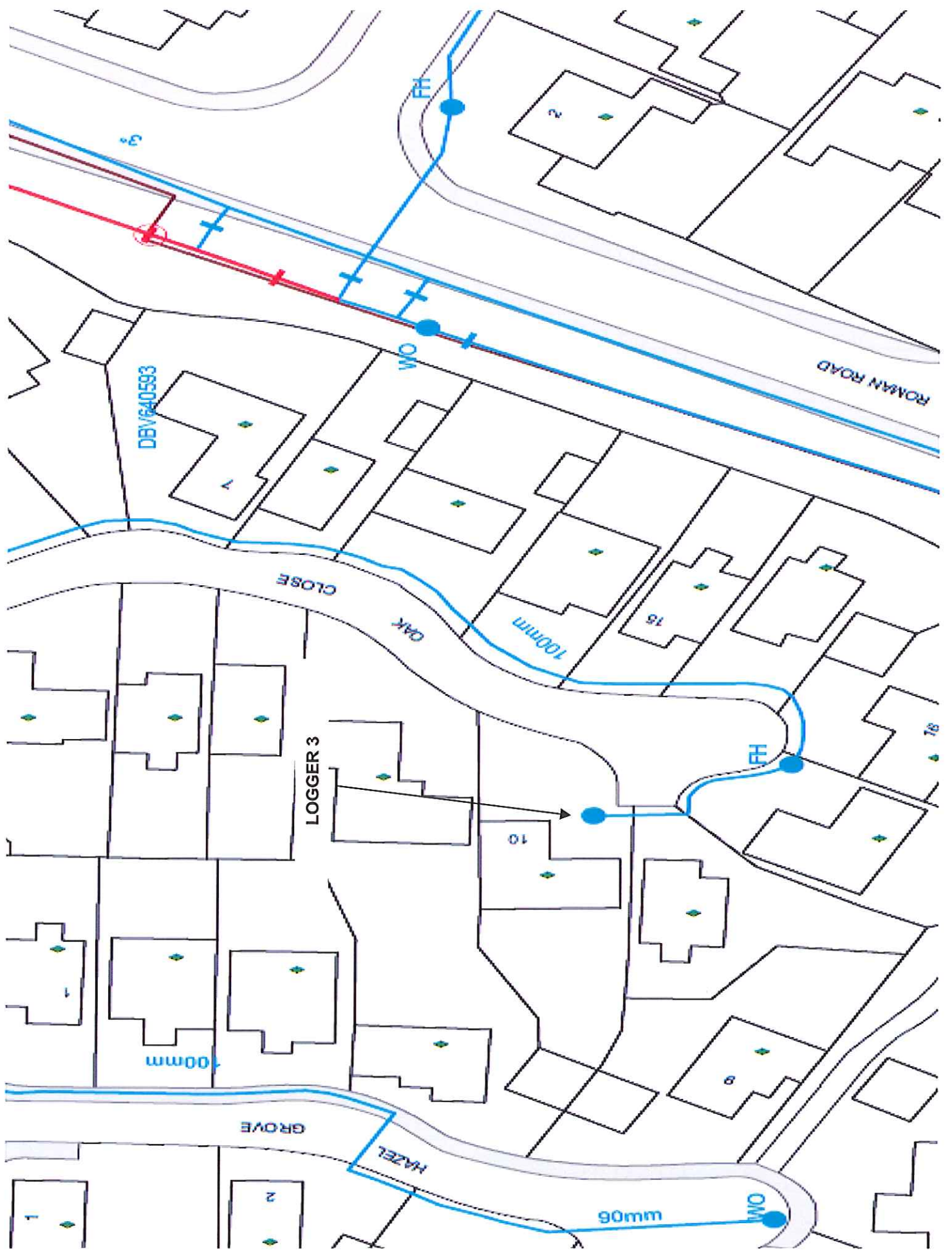
69

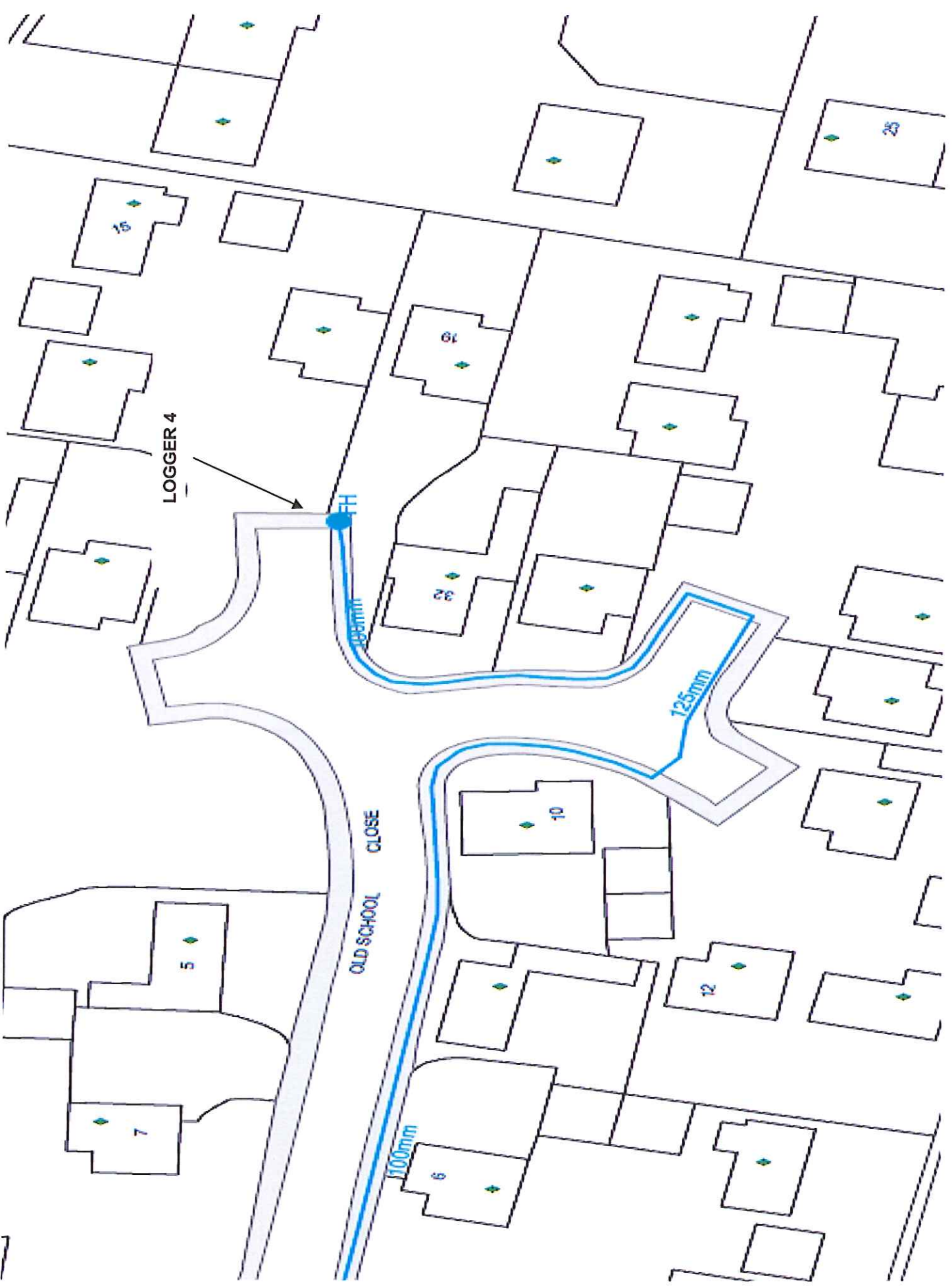
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83

85







LOGGER 4

OLD SCHOOL CLOSE

150mm

125mm

100mm

7

5

16

32

19

25

10

12

6